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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,849	02/11/2002	Bardo Schmitt	216745US0	8959

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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ZUCKER, PAUL A

ART UNIT	PAPER NUMBER
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1621

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DATE MAILED: 05/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

10/068,849

Applicant(s)

SCHMITT ET AL.

Examiner

Paul A. Zucker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5. 6) ☐ Other: .

**DETAILED ACTION**

***Specification***

1. The abstract of the disclosure is objected to because it simply reproduces claim 1.

Applicant should revise the abstract so that it clearly describes the contribution that the invention makes to the art. Correction is required. See MPEP § 608.01(b).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 8 and 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Hurtel et al (US 4,857,239 08-1989). Hurtel discloses (Column 3, lines 15-50) the synthesis of acrylic anhydride from acrylic acid and acetic anhydride (in a 1.5 molar ratio which lies within the 2-1 range instantly claimed) in the presence of copper sulfate (a Cu containing metal salt catalyst) and phenothiazine (a stabilizer). Hurtel further discloses distillation of the final product acrylic anhydride which is thereby separated from the copper sulfate catalyst. Claims 1-3, 8 and 10-13 are therefore anticipated by Hurtel.

***Claim Rejections - 35 USC § 103***

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hurtel et al (US 4,857,239 08-1989) in view of Hinenoya et al (US 4,830,789 05-1989).

Instantly claimed is a method for the preparation of an unsaturated carboxylic acid anhydride comprising reacting an unsaturated carboxylic acid with a lower aliphatic carboxylic anhydride in the presence of a catalyst and a stabilizer. A method for the synthesis of methacrylic anhydride is also specifically claimed.

Hurtel teaches (Column 3, lines 15-50) the synthesis of acrylic anhydride from acrylic acid and acetic anhydride (in a 1.5 molar ratio which lies within the 2-1 range instantly claimed) in the presence of copper sulfate (a Cu containing metal salt catalyst) and phenothiazine (a stabilizer). Optimization of the acid/anhydride ratio is readily accomplished by one of ordinary skill in the art. Hurtel further teaches distillation of the final product acrylic anhydride which is thereby separated from the

copper sulfate catalyst. Hurtel does not exemplify the application of this process to the synthesis of the acrylic acid homologue methacrylic anhydride. Hurtel does, however, exemplify (Column 2, lines 21-49) the synthesis of acrylic anhydride. It would have been obvious therefore to apply the process exemplified for the synthesis of acrylic anhydride to the synthesis of the homologous methacrylic anhydride with a reasonable expectation of success.

The difference between the instantly claimed process and that taught by Hurtel is that Hurtel does not suggest the use of metal salt catalysts with carboxyl-containing anionic counterions.

Hinenoya, however, exemplifies (Column 6, lines 30-34) the use of chromium acetate as a metal salt catalyst (which contains an organic carboxylate counterion) for the production of pyromellitic anhydride (an unsaturated anhydride) from pyromellitic acid and acetic anhydride. Hinenoya further teaches (Column 1, line 64-column 2, line 3) that reaction at high temperature causes decomposition of acetic anhydride to form ketene which forms tar. Hinenoya teaches (Column 2, lines 33-41) the use of metal catalysts selected from the group of metals of Groups I, II, III, V, VII and VIII of the periodic table and specifically names the metals Co, Ni, Mn, Fe, Li, Na, K, Mg, Ba, Ca, Cu, Zn, Al, Ti and V. Hinenoya further teaches (Column 4, lines 37-40) that the addition of a metal ion catalyst allows short reaction times under mild conditions with inhibition of the formation of tarry products.

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One of ordinary skill in the art would therefore have been motivated to lower the temperature, and improve the product, of the anhydride exchange reaction taught by Hurtel by modifying his process by addition of the metal salt catalysts of Hinenoya. Hinenoya provides the suggestion for combination in his teaching that anhydride exchange reactions employing acetic anhydride (and, presumably, other aliphatic anhydrides capable of forming ketenes) may be improved through the use of metal catalysts. Because of the closely related fields of invention there would have been a reasonable expectation for success.

### ***Conclusion***

4. Claims 1-20 are pending. Claims 1-20 are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 703-306-0512. The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann R. Richter can be reached on 703-308-4532. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-4556 for regular communications and 703-308-4556 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235.

Paul A. Zucker  
Patent Examiner  
Technology Center 1600

May 27, 2003

A handwritten signature in black ink, appearing to read "J. Richter", is positioned above a horizontal line.

Johann Richter, Ph.D., Esq.  
Supervisory Patent Examiner  
Technology Center 1600